

Material power or normative conflict: determinants of the interaction between global and local agrifood governance

Fuchs, Doris; Glaab, Katharina

Veröffentlichungsversion / Published Version
Arbeitspapier / working paper

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:
SSG Sozialwissenschaften, USB Köln

Empfohlene Zitierung / Suggested Citation:

Fuchs, D., & Glaab, K. (2010). *Material power or normative conflict: determinants of the interaction between global and local agrifood governance*. Münster: Universität Münster, FB Erziehungswissenschaft und Sozialwissenschaften, Institut für Politikwissenschaft. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-257373>

Nutzungsbedingungen:

Dieser Text wird unter einer Deposit-Lizenz (Keine Weiterverbreitung - keine Bearbeitung) zur Verfügung gestellt. Gewährt wird ein nicht exklusives, nicht übertragbares, persönliches und beschränktes Recht auf Nutzung dieses Dokuments. Dieses Dokument ist ausschließlich für den persönlichen, nicht-kommerziellen Gebrauch bestimmt. Auf sämtlichen Kopien dieses Dokuments müssen alle Urheberrechtshinweise und sonstigen Hinweise auf gesetzlichen Schutz beibehalten werden. Sie dürfen dieses Dokument nicht in irgendeiner Weise abändern, noch dürfen Sie dieses Dokument für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen.

Mit der Verwendung dieses Dokuments erkennen Sie die Nutzungsbedingungen an.

Terms of use:

This document is made available under Deposit Licence (No Redistribution - no modifications). We grant a non-exclusive, non-transferable, individual and limited right to using this document. This document is solely intended for your personal, non-commercial use. All of the copies of this documents must retain all copyright information and other information regarding legal protection. You are not allowed to alter this document in any way, to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public.

By using this particular document, you accept the above-stated conditions of use.

Material Power or Normative Conflict: Determinants of the Interaction between Global and Local Agrifood Governance

Abstract

We witness a constant interaction of global and local forces in the global agrifood system. This paper develops an analytical framework for the identification of the relative impact of these global versus local forces on the sustainability of the agrifood system. In pursuit of its objectives, the framework highlights material and ideational sources of power as important determinants of how the contest between global and local actors and norms in global agrifood governance plays out. With this framework, the paper provides an integrating function for the panel. In addition, the paper will employ the framework in an empirical investigation of determinants of policies and practices regarding genetically modified organisms (GMOs) in India. GMO policies and practices represent a contested ground where (different) 'local' and 'international' values clash, while at the same time, the discursive power of the biotech industry is highly visible. In consequence, the case of the commercial introduction of GMOs, and specifically the example of 'Golden Rice' in India, presents excellent evidence for the need to look beyond material sources of power and consider the ideational ones and their interaction with the material dimension, if one wants to understand the complexities of agrifood governance.

Prepared for presentation at the ISA Annual Convention, February 17-20, 2010, New Orleans, United States.

¹ Chair of International Relations and Development Politics, University of Muenster, Germany, doris.fuchs@uni-muenster.de

² Research Fellow at the Chair of International Relations and Development Politics, University of Muenster, Germany, katharina.glaab@uni-muenster.de

Introduction³

The sustainability of today's global agrifood system is shaped by the interaction of global and local forces. These forces are of a material and ideational nature and result from agency by state and non-state actors as well as structural contexts. The resulting picture is a complex web of forces that makes it hard to grasp the interplay and conflicts of the involved powers. Which are the most powerful determinants of the sustainability characteristics of global agrifood production and consumption today?

One of the major problems in the global agrifood system is its lack of sustainability. Global food security and safety are still distant goals. In 2009, 1020 million people were suffering from hunger (an increase of 97 million people from 2008) and 6 million people will have died from malnourishment according to FAO (Food and Agriculture Organization 2009). At the same time, even those who have enough to eat face health threats from unsafe food production methods, and today's agricultural practices are associated with biodiversity loss, greenhouse gas emissions, and soil erosion and degradation to name just a few of the relevant environmental problems. The sustainability of the global agrifood system, then, is too important an issue for the question of its determinants to be neglected simply because they may be difficult to identify.

In consequence, a comprehensive and systematic analytical framework is needed for investigating the interaction between the different global and local forces and their impact on the sustainability of today's global agrifood system. This paper aims to develop such a framework. It does so in three steps. The paper will first describe the complex interaction between different types of global and local forces in the global agrifood system and its governance. In a second step, the paper will develop a framework to analyze power relations, allowing a comprehensive and systematic assessment of these forces. Thirdly, the paper will illustrate the empirical applicability of the framework in an investigation of determinants of policies and practices regarding genetically modified organisms (GMOs) in India, focusing on the example of 'Golden Rice'. The concluding section will sum up the argument and discuss implications for science and politics.

³ We thank Tobias Gumbert for his research assistance for this paper as well as Ulrich Hamenstädt, Stephan Engelkamp, and Antonia Graf for valuable comments on earlier drafts.

Global and Local Forces in the Agrifood System

The current agrifood system represents an increasingly globalized system of commercial trade, which pools a multitude of participating forces. Liberalization and globalization of agriculture and food have had tremendous impact on the organizational structure of the system, actor constellations and interaction within. Today, state as well as non-state actors at various levels of governance play a pivotal role in the governance of the global agrifood system. At the same time, a variety of norms including sustainability, efficiency and modernity, for instance, influence the governance of the agrifood system. Regarding both, actors and norms, importantly, we can observe an interaction and sometimes contest between global and local forces in the global agrifood system.

The “logic of distancing” between the production and consumption of food is one major development closely associated with organizational and structural shifts of the global food system (Kneen 1995; Friedmann 1992). Today, a large variety of actors situated along global supply chains pursue their interest in the agrifood system and its governance and their activities determine the opportunities and constraints for a sustainability transformation of the system. Specifically, market concentration in food production, processing, retailing on the input side have fostered the rise of powerful agrifood corporations and the marginalization of small- and mid-size farming on the production side as well as small businesses on the retail side (Lang 2003). As a consequence, agrifood corporations, today, exercise substantial power in the governance of the global agrifood system, influencing public regulation in their interest, but just as importantly creating, implementing and enforcing self-set rules and standards as well (Clapp and Fuchs 2009). Next to this rise of corporate actors in a globalized world, the traditional problem solving capacity of the state has rapidly decreased (Jessop 2008). Still, governments continue to play a pivotal role in global food governance due to their capacity to determine trade rules, agricultural subsidies or market access for GMOs and chemicals, for instance. Partly as a response to these developments, new social movements anxious about the environmental and social implications of the architecture of the current agrifood system try to influence its governance (MacMillan 2005). Moreover, local communities continue to play an important role in shaping the sustainability of the agrifood system (Scott et al. 2009). The established rules and norms, thus, often compete with new ones over authoritative legacy.

The opaqueness of agrifood governance, which results from the interplay between various types of actors, is further enhanced by their activities at various levels of governance. Importantly, the different levels of governance cannot be assigned individually to different

types of actors. While one tends to think of agrifood corporations as global actors and civil society actors as representing the local level, reality is much more complex. This can be more easily observed in the case of civil society actors, where NGOs such as Greenpeace or Oxfam are known to pursue their goals and ideas across borders and at all levels of governance. Large business actors, however, can also come to play the role of ‘local actors’. In India, for instance, global retail chains have found it extremely difficult to get market access and Indian retail chains dominate the market. Even if the latter do not represent ‘local’ forces, as one would associate them with the village level, the role of such national or even regional (sub-national) retail chains needs to be examined in the interplay of local and global forces. Public actors, of course, play a role at all levels of governance as well, from the local to the supranational level.

Next to the complex interplay of global and local actors in the global agrifood system and its governance, a strong influence of a range of norms can be identified. Faced by increasing consumer awareness after various food scandals such as the discovery of BSE or dioxin scandals, public as well as private actors have stressed the need for improvements in agrifood governance in the interest of food safety (Phillips and Wolfe 2001). Simultaneously, public and private actors emphasize the lack of food security in many developing countries as a continuing sustainability deficit of the global food system. Both food safety and food security, in turn, depend on a range of sustainability characteristics of the agrifood system. The definition of the Sustainable Food Laboratory highlights the complexity of social and environmental aspects of sustainability in the food chain:

“We define a sustainable food system as one in which resources (including natural resources such as soil and water, as well as human resources such as labor) are used at their rate of recovery. As a result, the fertility of our soil is maintained and improved; the availability and quality of water is protected and enhanced; biodiversity is healthy; farmers, farm workers, and all other actors along the supply chain have livable incomes; the food we eat is safe and promotes our health; businesses can thrive; and the carbon and energy footprints of production are within the limits scientists correlate with relative safety.” (Sustainable Food Laboratory)

Yet, these different norms underlying governance in pursuit of a sustainable global agrifood system may well be at odds/conflict with each other, or impose different costs and benefits on different parts of the global population. Governance initiatives intended to improve food safety for consumers in the North, for instance, most prominently retail standards such as the GlobalGap, have been found to hold potentially disastrous implications for rural livelihoods in the South (Scott et al. 2009). Thus, perspectives on what constitute

sustainable food production and consumption practices may well differ in different societies and regions.

Even more fundamentally, we can identify democratic ideals and market logic as two normative approaches contesting each other in global agrifood governance:

“The history of food governance can usefully be understood as a long struggle between two conflicting forces: ‘food democracy’ and ‘food control’: the latter suggests relatively few people exerting power to shape the food supply; the policy framework is *dirigiste*; decisions are ‘top-down’ [...] ‘Food democracy’, on the other hand, gives scope for a more inclusive approach to food policy. Its ethos is ‘bottom-up’, considering the diversity of views and interests in the mass of the population and food supply chain [...]” (Lang and Heasman 2004, 279)

Again, however, while one might be inclined to associate the market logic in food governance with global actors and democratic ideals with the local level, both norms refuse such a simple dichotomy. After all, supra-national actors such as the United Nations Development Program (UNDP) or transnational civil society actors would tend to also claim democratic norms and/or practices for themselves. Likewise, local economic actors also try to maximize their control over market shares, profits, regulation and the associated distribution of rents.

Both global and local actors and norms, then, seem to be influential factors in the governance of today’s global agrifood system. Importantly, they differ in their ability to exercise power and draw their influence from different sources. Global agrifood corporations, especially food retailers or agribiotech companies, have great material resources at disposal, which puts them in a potentially very influential position to impact political decisions. Likewise, the state still possesses considerable decision-making power due to its authority in national and international regulation of relevant policy areas. In contrast, civil society actors, especially local ones, tend not to command huge material resources, but their ability to influence political decisions is often enhanced by the public perception of them as legitimate political actors. At the same time, global and local business, state, and civil-society actors are embedded in a setting shaped not only by actor-specific sources of power, but also by forces existing at the structural level, such as market structures or societal norms and values. In consequence, agrifood governance cannot be easily ascribed to a causal chain between the exercise of power by a specific actor and a specific outcome, but needs to be considered in context of the interaction of different global and local sources and facets of power. Only an analysis systematically conceptualizing the multiple dimensions of power at play in the governance of the global agrifood system, then, is truly able to shed light on the role of global and local forces in it.

Analyzing Power Relations in the Global Agrifood System

A theoretic framework for analyzing power relations and the role of global and local forces in the global agrifood system is faced by the problem that the existing theoretical approaches in International Relations (IR) theory have approached questions of power from fundamentally different perspectives. Specifically, realist and neoliberal institutionalist approaches have tended to focus on the exercise of power by actors, states in the case of realist approaches and state and non-state actors in the case of neoliberal institutionalist approaches. Critical and post-structuralist approaches, however, have highlighted the power of structures, for instance hegemonic blocs and discourses. Numerous scholars have criticized the theoretical limitations inherent in this agent-structure differentiation and call for an integrative framework that looks at the interaction and relation of different types of power. In this respect, Barnett and Duvall (2006) remind us of the frequently made distinction between the two possible ways power can be exercised: 'Power over' refers to actions, where actors are able to exercise control over others, while 'power to' points to social relations of constitution that define actors as well as their capacities and resources. This conceptual distinction is especially useful when looking at the diverse composition of the global agrifood system, where a sole focus on actors' power hides the structural forces that influence an actor's role and behavior. Simultaneously, a focus on the influences of structures would neglect the agency exercised by actors in shaping the system and its structures. The mutual constitution of social structures and actors in the global agrifood system, then, points to the benefits of a framework that distinguishes and integrates different dimensions of power. Such a perspective enables the analysis to include the relevant plethora of (in)visible forces and their interactions, as well as their sources of power.

Here, we develop a framework that allows us to delineate that the meaning and effects of actions and structural influences depend heavily on their material or ideational nature. This framework emphasizes that actor-specific as well as structural power can be based on material sources such as the distribution of economic or technological resources or on ideational resources such as legitimacy or cultural embeddedness. In the following, we will demonstrate that it is crucial to identify these material and ideational dimensions of power in order to analyze the power of different global and local actors and norms and understand their interaction.

According to some theoretical approaches in IR, material dimensions of power are considered to be the foundation of most political activities. Traditionally, IR theories,

specifically realist ones, considered primarily military means, i.e. arms and weapons, as material sources of power. This approach's main focus was on state power, of course. From a broader perspective considering state and non-state actors, material power is made up of capabilities grounded in the economic realm such as modes of production, information, finance and technology as well. Taking material capabilities into account means to pay attention to the influence of changes in production and consumption processes on the power of actors. In consequence, this approach acknowledges the changing potential influence of actors due to globalization processes and similar major socio-economic transformations. Material capabilities influence actors' strategies and interests and build the material conditions for their actions in certain policy fields. In other words, material resources define the behavioral options of actors both on the input and output side of the political processes (Fuchs 2007).

However, material resources only have limited explanatory power as long as the political process and the translation of these resources into political influence are not considered. It is important to keep in mind that it is not the mere size of material resources, but the ability to successfully convert them into advocacy tools, which determine actor-specific material power (Fuchs 2007, 82). Thus, actors with relatively less material resources may be able to exert more power due to the greater fungibility of these resources or the pairing of material and ideational power, for instance.

Next to material power, then, ideational power represents a fundamental dimension of power. Looking at the ideational sources of power highlights the symbolic meaning of social practices and institutions for the exercise of power and how they enable and constrain behavior and action.

“It is not power in the sense of prevailing in overt conflict, [...] or possessing structural indispensability. Instead it involves a more subtle and perhaps smaller-scale kind of power than any of these – a presence at multiple levels in society and a place in multiple conversations, which allows a set of voices to be heard and a set of interests to be taken seriously almost everywhere. This is power as a discursive presence.” (Himmelstein 1997, 143)

A focus on ideational sources of power stresses the normative dimension as a nonmaterial power resource and identifies an actor's ability to influence the framing of political issues as a crucial asset, for instance. This “third face of power” (Lukes 2005) points to the discursive power an actor can exercise and the definition and framing of policies, actors, and of norms and procedures for problem-solving and conflict resolution. In other words, a focus on the ideational sources and forms of power turns the focus on actors' ability to

influence discourses, which Hajer defines as “a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities” (Hajer 1995, 44). This perspective highlights that via the exercise of discursive power, actors can organize “some definitions of issues [...] into politics while other definitions are organized out” (Hajer 1995, 42). In a struggle for discursive hegemony on the meaning of political issues, actors try to influence the construction of a prevalent perception and definition and to consolidate selected normative assumptions.

It is difficult to assess the characteristics of this subtle form of power; however, Koller traces its exercise through norms, ideas and societal institutions and maps it in culture, discourse, and communicative practices (Koller 1991). But since any communication includes both intentional and unintentional messages, the recognition and assessment of intent and agency becomes particularly difficult. After all, actors are objects as well as subjects in discourse (Fuchs 2005). Thus, while (some) norms can be manipulated by actors, others structure social relations so deeply that they may shape actors’ identities, perceptions, and behavioral options more than the actors are able to shape them. Due to the all-encompassing nature of such deep-seated normative structures, they are extremely difficult to challenge. Here, Foucault’s notion that the structural power of discourse will gradually materialize seems evident (Rabinow 1984). In other words, although norms may form instable ideal factors, some deep-seated normative structures are already so internalized that their existence is hardly scrutinized. This takes us back to the point that ideational power is a form of power that is empirically hard to trace.

In order to further define material and ideational power for our analysis, it is crucial to identify core aspects and determinants of material and ideational power, then. What determinants of material and ideational power can we identify and how can they be applied to empirical phenomena in global agrifood governance? Material power can be approached via an assessment of resources, which may be transformed into influence. Financial means are frequently considered an important material source of power, as they are highly fungible and can be easily converted into political activities. The more financial means actors have at disposal the more it is likely that they will be able to influence politics via lobbying and campaign/party finance activities. Financial means not only can allow political influence via direct campaign or party donations, but also allow actors to hire professional lobbyists and PR consultants or to be present at multiple sites and levels of governance simultaneously, for instance. Non-state actors, in particular transnational corporations, have realized that

involvement in policy processes is a promising strategy to influence political outcomes and have therefore dramatically expanded their political activities. The increasing dependence of political decision makers on funding as well as external expertise has improved interest groups' access to politicians and bureaucrats and enhanced the prominence of this aspect of actors' material power (Fuchs 2007). There is a huge gap between different non-state actors with regard to the financial means, on which these political activities rely. However, while many corporate actors have been able to accumulate huge financial resources, most civil society actors tend not to have the same capacities at disposal.

Besides financial means, market power also forms an important source of material power. This power has traditionally been described as structural power in IR and International Political Economy (IPE) literature. On the one side, market control arising from monopolistic or oligopolistic market structures presents a source of material power. In the agrifood sector, such structural material power is omnipotent. More than 80 percent of the global markets in wheat, corn, coffee, cocoa or tea are each controlled by just three corporations (Deutscher Bundestag 2002). In the narrow sense, such market control reflects economic power. This economic power is translated into political power, however, as soon as market control is paired with agenda- or rule-setting activities affecting the wider public. Thus, structural material power is reflected in the ability of TNCs to shape political agendas, due to the dependence of political elites on the provision of jobs and investments by the private sector. This aspect points to the predetermination of the behavioral options of political decision makers and leads to the exclusion of certain issues from the political agenda (Fuchs 2007, 58). This is linked to the discussion on the decreasing capacity of the state as a consequence of far-reaching globalization processes; while at the same time, a growing influence of private actors, especially globally active corporations, can be observed. It is also reflected in private governance initiatives, in which *de jure* voluntary standards set by agrifood corporations become *de facto* mandatory for suppliers due to the corporations' market control.

At the same time, consumers have structural material power in the form of market power as well. After all, consumer demand (especially from industrialized countries) can shape global economic flows and the associated allocation of value in the global agrifood system. This structural power of consumers should not be overestimated, however, as it only exists to a notable degree on occasions in which a very large number of consumers share preferences and/or act in a similar manner. Only under such conditions may consumers challenge the market power of business actors. Moreover, information asymmetries in a

global economy based on the distancing of production and consumption, as pointed out above, constrain consumer power dramatically.

In sum, a focus on structural material power points to the often historically fixed material structures of global production and consumption processes. Thereby, it sheds light on some of the sources of power, on which actors in the global agrifood system can draw. At the same time, such a focus also allows the identification of the marginalized and excluded actors in the global economy.

When analyzing ideational power, one of the crucial aspects to consider is authority. Following Arendt, we define authority as legitimate force. Along the same lines, Cutler, Haufler and Porter conceptualize private authority as “decision-making power over an issue area that is generally regarded as legitimate by participants” (Cutler et al. 1999, 362). In other words, the question of legitimacy becomes crucial. In IR for instance, Nye’s notion of soft power speaks to the ability of military and economically weak states to define policy due to their normative authority (Nye 1991). In a similar manner, non-state-centered approaches will suggest that actors’ ability to influence discourses is closely linked to perceptions of their legitimacy and requires trust in the potential validity of messages. Public actors obtain political legitimacy through formal electoral processes, while non-state actors’ legitimacy derives from public trust in actor’s expertise and/or willingness to represent the public interest. The authority and legitimacy of NGOs, in particular, originates in ideal-type assumptions on their non-profit-oriented and non-violent aims (Holzscheiter 2005, 726). But even business actors’ political authority has benefited from a public change in attitudes toward market actors and increasing public confidence in their problem-solving ability since the rise of neoliberalism (Fuchs 2007).⁴ In addition, business has also actively tried to improve on its moral sources of legitimacy with the engagement in and shaping of legitimizing discourses such as ‘greening of industry’, ‘corporate citizenship’ or ‘corporate social responsibility’ (CSR). At the same time, non-state actors such as NGOs use discursive strategies in the form of ‘naming’, ‘framing’, and ‘shaming’ to create pressure and negative publicity in order to delegitimize business or public authority (Arts 2003; Holzscheiter 2005). The legitimacy of actors and ideas is embedded in social structures. Legitimacy is shaped by discourses and at the same time reinforces them in practice. This embeddedness makes legitimacy an especially strong determinant of ideational power.

⁴ Even in the context of the global financial crisis, trust in business actor’s problem-solving capacity does not seem to be decreasing, as their ongoing inclusion as advisors in national rescue plans has shown.

Another important dimension of ideational power is knowledge, which refers to the processing of information. Including knowledge as a critical determinant of power is to question the objectivity of knowledge claims and to include the notion of struggle about truths. Paying attention to the social construction of knowledge means recognizing that what is perceived as objective knowledge, as fact and truth, and therefore is hardly contested, is actually formed and shaped by actors' communications and the strategic issuance of information. Multiple actors are involved in this process and compete for the power of interpretation. The complexity of political decisions increasingly requires highly specialized knowledge, "and those who control this knowledge have considerable power" (Nelkin 1975, 37). Policymakers increasingly rely on non-state actors' specialized knowledge and information, which gives them an incentive to involve especially business actors and NGOs in the policy making process. Here, they are not only represented on the national level, but are also actively involved on the international and supranational level. On the international level, for instance, the development process of the Cartagena Protocol on Biosafety supports the case that NGOs and business agents are more and more involved in important political negotiations and decision-making together with traditional governmental actors (Bail et al. 2002). Next to economic and technological information, scientifically based knowledge seems to have a strong power of interpretation in the public debate, which results from a generally positive perception of scientific expertise and objectivity. At the same time, science pervades all aspects of social and political life. Scientific knowledge "embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions – in short, in all the building blocks that we term the *social*" (Jasanoff 2004, 3, emphasis in original). The readiness to accept expert knowledge and award scientific knowledge extensive authority is comparatively high among public and private actors. However, one may want to question whether matters concerning science and technology in the decision-making process can in fact be apolitical and simply rely on an 'objective' specialized knowledge of experts:

"As scientists debate the various sides of political issues, their involvement undermines the assumptions about the objectivity of science, and these are precisely the assumptions that have given experts their power as the neutral arbiter of truth." (Nelkin as cited in Bocking 2004, 31)

Material and ideational power do not exist independent of each other, but reveal a high grade of interaction. Gramscian scholars, in particular, highlight the crucial link between material and ideational forms of power. Two pivotal modes of interaction exist: access and reconstitution. Access as a mode of interaction manifests itself firstly in organizational terms and highlights the ability to gain access to political decision-making bodies. Accordingly, it

points to the importance of organizational structures in decision-making bodies and the restrictions and access opportunities they offer to actors. The extent to which actors gain access to material structures of governance depends on their resources as well as the perceived political legitimacy of these actors and their resources. Thus, both material and ideational factors influence actors' access to governance institutions and structures. Next to this organizational dimension of access, the question of access to knowledge reveals another interaction between material and ideational power. Material sources allow actors to fund research, or pay for conferences and publications. Thereby, material sources greatly facilitate both the gathering and the communication of knowledge. As knowledge is not an objective item, as pointed out above, the ability to determine which questions are being asked and which results are being communicated (how), certainly adds to an actor's power in today's world.

As a related matter, the issue of reconstitution also reflects the interaction between material and ideational sources of power. The success of narratives and storylines can be influenced by the repetitiveness, with which corresponding messages are sent. In the era of mediatized politics, then, financial resources can be used to strengthen one's preferred ideas and norms or weaken competing ones. PR strategies and media campaigns can often be very costly. Consequently, actors with large financial resources have a relative advantage to non-market actors i.e. business' financial capacity enables to buy media space and time (Fuchs 2005). Noelle-Neumann (1996) speaks of the existence of a *Schweigespirale* in the presence of communicative asymmetry. In the past, new telecommunication technologies had been expected to lead to greater balance in the abilities of actors to shape public opinion, as these technologies allow communication in both directions and carry substantially lower costs. Yet, studies show that these new communication channels worldwide are used primarily for private economic interests too (Reljić 2001). In this context, one has to ask how public the public debate really is.

In other words, neither the material nor the ideational sources of power should be considered just by themselves. There is always an interaction between them. These interaction processes may be particularly difficult to analyze. Nevertheless, the reinforcement and reconstitution of each other are too important for the shaping of power relations to ignore them.

Consequently, this framework proposes to analyze power relations according to the material and ideational dimensions of actors' power and their interaction on the local and

global levels of governance (see table 1). The explanatory power of this framework will be illustrated in a next step with the help of the example of GMO politics and more precisely ‘Golden Rice’ in India.

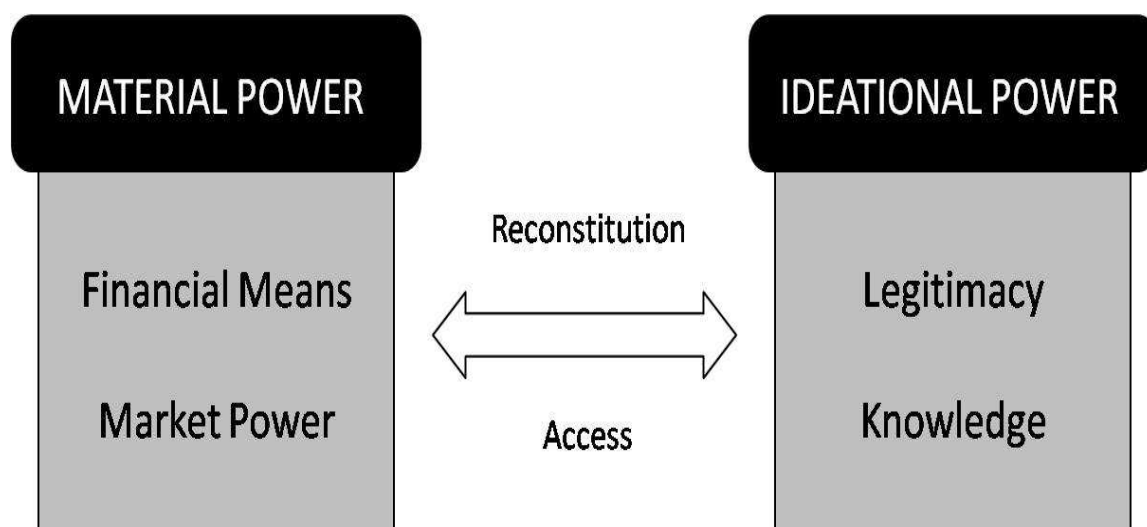


Table 1: Material and ideational determinants of power

Determinants of GMO Politics and ‘Golden Rice’ in India

Biotechnology in general and agricultural biotechnology in particular are highly controversial. Critical observers argue that the genetic modification of crops entails unforeseeable environmental and health risks. In contrast, proponents claim that this technology represents an opportunity for countries to assure a reliable food supply and, for developing countries in particular, to overcome food security problems. Accordingly, agricultural biotechnology represents a highly contested policy field, in which a range of actors and norms clash.

The Indian case is particularly interesting for an analysis of GMO politics. India is a major producer and exporter of agricultural products as well as facing a huge domestic demand for food. Agriculture represents the most important economic sector in the country and plays an outstanding role for socio-economic development in the Indian Union.⁵

⁵ The agricultural sector makes up with 18.6 percent for a large share of India’s GDP (Friedmann 2004), while 55 percent of its total workforce is employed in agriculture (Millstone and Lang 2008).

Moreover, India already is the fourth largest producer of biotech crops, mainly Bt⁶ cotton, planting an area of 7.6 million hectares (James 2008). As a GM crops growing country, India has a potential demand and market for further GM technologies and is therefore in the focus of seed producers market activities. At the same time, trade barriers related to GMOs, such as in the EU, enhance fears that GM crops might destroy India's export market and global market share in agricultural production (Living on Earth Jan 30, 2009 [Air Date]).

The protracted introduction and heated discussions about the costs and benefits of 'Golden Rice' in India provide an excellent example of political contests around the introduction and diffusion of biotechnology in the agricultural sector. 'Golden Rice' was invented in 1999 with the expressed aim of combating malnutrition and especially vitamin A-deficiency (VAD). It gets its name from the yellow color the provitamin, which has been added via genetic engineering, entails. VAD poses a problem in many developing countries and the WHO estimates that it causes 250,000-500,000 of vitamin A-deficient children to become blind every year and half of them dying within twelve months of losing their sight (World Health Organization 2010). In consequence, proponents of 'Golden Rice' argue that it will enhance health and life expectancy of consumers. Critical scholars and activists, however, question the promised health benefits and highlight the safety risks of genetic engineering as well as adverse social and economic side-effects associated with a broad introduction of 'Golden Rice'.

'Golden Rice' itself provides a particularly interesting example of GMO politics. First, the large corporations in control of the global market appear to have no direct economic interest in introducing this product to the market. Syngenta and Monsanto, the companies that owned the Intellectual Property Rights (IPR), which were relevant for the development of 'Golden Rice', have donated their patents to the Golden Rice Humanitarian Project in order to allow a 'Freedom-to-Operate' for humanitarian purposes in developing countries. Thus, the main proponents of 'Golden Rice' have been public actors and scientists.

Secondly, 'Golden Rice' has proven to be highly controversial in its introduction and represents a case of long and protracted battle in agrifood governance. India as a rice-based society with a large agricultural sector, which is already a GMO producing country, could be expected to be very interested in this new rice technology. Indeed, India's state owned research labs, the Indian Agricultural Research Institute in New Delhi, the Tamil Nadu

⁶ Bt stands for the bacteria *Bacillus Thuringiensis* that is used in the production of the transgene product Bt cotton.

Agricultural University (TNAU) and Hyderabad-based Directorate of Rice Research, have been conducting research on 'Golden Rice'. But more than a decade after its initial intervention, the bio-engineered rice is still not available, despite the corporate donations of the IPRs. Furthermore, the director at the Department of Biotechnology (DBT) of the Ministry of Science and Technology, S.R. Rao has declared that there are no proposals to carry out clinical trials at this moment (Bisserbe Aug 22, 2008). This raises the question, why the introduction of 'Golden Rice' has been protracted in India? Which actors were involved in this political process? How can this development be explained on the basis of the existing distribution of material and ideational power?

As we show below, the case of 'Golden Rice' reveals the crucial role ideational dimensions of power play in agrifood governance. We do not mean this case to be understood as proof that ideational power generally is more important than material power. Rather, we have chosen a case emphasizing the role of ideational power because of the traditional focus on material power in IR. What the case does show is that under certain conditions material power by itself is not sufficient. Before discussing the specifics of the interplay of different norms and ideas in this case, however, let us briefly discuss the dimension of material power.

Typically, an analysis of power politics in GMO governance will point out that the global market for GMOs, is characterized by an oligopolistic if not monopolistic market structure, i.e. an enormous degree of concentration in control over GMO production and distribution.⁷ Such an analysis would then highlight that the 'other side' of GMO politics is made up of millions of small farmers. For India specifically, one would also point out that the comparatively weak financial situation of these millions of farmers is worsened by the fact that the rural poor have little access to credit.⁸

However, the distribution of material power between these non-state actors appears to be less important in this case. The development of 'Golden Rice' did not come from the

⁷ Monsanto, Syngenta, Bayer, Dow and Du Pont are the main corporations in control of the distribution of GM crop varieties. Monsanto alone controls 90 percent of global biotech acreage. These multinational corporations also play a prominent role in the Indian biotech market. In 2004, three out of ten private-sector companies working on GM crop development were foreign multinationals with large biotech portfolios (Newell 2007, 186).

⁸ This is the case even though India holds a wide net of rural finance institutions, due to "inefficiencies in the formal finance institutions, the weak regulatory framework, high transaction costs, and risks associated with lending to agriculture" (World Bank 2009). Mohan sees the indebtedness of farmers in India directly connected to the climate and geographical cultivation structures: "With the intermittent failure of the monsoons and other customary vicissitudes of farming, rural indebtedness has been a serious and continuous characteristic of Indian agriculture. Because of the high risk inherent in traditional farming activity, the prevalence of high interest rates was the norm rather than an exception, and the concomitant exploitation and misery that often resulted" (Mohan 2006, 993).

private agribiotech sector that dominates the market.⁹ Rather it has been promoted by public actors, including governmental actors, supranational organizations, civil society actors such as large foundations, and scientists. The Rockefeller Foundation, for instance, has invested large amounts of money in rice biotechnology research and capacity building (Kryder et al. 2000). It has funded the Golden Rice project since the early 1990s and supported it during the entire project span. Funding was followed up by other public organizations as the Swiss Federal Institute of Technology (1993-1996), the European Community Biotech Program in its 'Carotene Plus' project (1996-2000) and the Swiss Federal Office for Education and Science (1996-2000). Today, the Bill and Melinda Gates Foundation is still involved in sponsoring the genetic modification of nutritionally enhanced seeds through their 'Grand Challenges to Global Health Initiative', supporting not only the development of 'Golden Rice' but also GM cassava, sorghum and bananas with about US\$ 36 million (Enserink Apr 25, 2008). Clearly, material resources by national and international public actors or civil society actors such as transnationally acting foundations can also represent material power in the political process. Thus, they could be juxtaposed to the material power resources of the farmers just as corporate ones. In the case of 'Golden Rice,' however, these material sources are not sufficient for explaining the protraction in its adoption. After all, the material power scale is highly tilted in favor of the actors promoting the development and introduction of the crop.

Indeed, the governance of 'Golden Rice' is best delineated as a battle of story lines (Glaab and Engelkamp 2010). Prominent among these story lines are the ideas of rationality or philanthropy, to which especially the proponents of 'Golden Rice' refer. The storyline of rationality is especially powerful, reflecting the Enlightenment tradition and demonstrating a faith in reason and progress. In this story line, agricultural biotechnology is an example of modernity and technologically advanced inventions are the foundation of problem-solving ability. The story line of rationality generally is a dominant and hegemonic theme in the Indian GMO debate. Traditionally, in India, "the concept of science [...] is that of the ultimate key to all problems facing the country, [...] scientists can lay claims to the charisma which in some other political cultures belongs exclusively to god-king" (Nandy 1990, 8). The declaration of 'Golden Rice' as a rational and scientifically based technical solution then is supposed to foster the legitimization of its political introduction. In fact, the hegemony of the rationality story line is so prevalent that various actors use scientific discourses to legitimize

⁹ Note that Potrykus, the original inventor, initially approached Nestlé, the world's biggest food company, for funding, who were not interested in the project. Later, Potrykus stated that this rejection was "fortunate" since it allowed public funding for the Golden Rice project (Potrykus 2001).

their position: “MNCs, Indian corporates, industry lobbyists, governments, international agencies, non-governmental organisations (NGOs) and farmers movements all claim [...] ‘science’ to be on their side“ (Seshia and Scoones 2003, 2). Critics, however, challenge the rationalistic view arguing that ‘Golden Rice’ is an indicative of a focus on a ‘technological fix’, while existing conventional solutions to vitamin A deficiency are ignored (Greenpeace 2005; Shiva 2000).

The story-line of philanthropy is also used by proponents of ‘Golden Rice’ and serves to frame the introduction of this GMO crop as a ‘humanitarian’ project and to connect it to the Universal Declaration of Human Rights (Golden Rice Humanitarian Board 2009). Even references to religious symbols such as Potrykus’ meeting with the pope and handing him symbolically a print of a research proposal, as well as bible citations in a pro-‘Golden Rice’ conference report (“I was hungry and you did not feed me” [Bertebos Foundation 2008]) are used to strengthen this story line of Western responsibility for the developing world. Critical scholars call it a PR strategy of private and public actors, who have developed creative ways to counterbalance their negative perception with moral power and solidarity (Shiva 2001).

On the other side, these narratives are often challenged with a story line that relates to the postcolonial condition. Defined against the history of colonization, ideals such as ‘swaraj’ (self-rule) and ‘swadeshi’ (‘of one’s own country’) reactualize imperialism and oppression and construct agricultural biotechnology as a threat to Indian identity and the national interest. The Gandhian anti-colonialist perspective, for instance, highlights the Indian people’s favor of self-sufficiency and suspicion of Western interests. This is highlighted in Indian discourses such as “We rear the chickens but who eats the eggs?”, “we are the owners of India, but who rules us?” (Assadi 2008), where the postcolonial problem of dependency of the West and of large corporations is employed. Using powerful symbols and the story line of India’s colonial history, actors are able to keep up a threat from Western control over seeds and their IPRs via ‘shaming’ and ‘naming’ activities. Although the IPRs of ‘Golden Rice’ have been donated by corporations, the story line of postcolonial dependency is still powerfully utilized by actors and appeals against the story lines of rationality and philanthropy.

Connected to these storylines are questions regarding the meaning and role of knowledge. Not surprisingly, “there is an ‘asymmetry of knowledge’ between scientists and the general public on scientific knowledge and understanding of the technology and its functions” (Osgood 2001, 92). Since R&D activities are mainly pursued by private biotech firms, most of the individual knowledge about technology development can be found in the

private sector, while the public sector only marginally generates new knowledge. In contrast to this technological knowledge stand the traditional and indigenous knowledge about agricultural practices on the regional and local level. Environmental activists like Vandana Shiva point out that a multitude of autonomous local food systems exist in India. Importantly, the traditional free exchange of seeds among farmers reflects certain knowledge related to culture and heritage and is an essential component of Indian people's livelihoods in rural areas (Shiva 2000). There, seeds are often seen as part of a reproductive cyclicity and continuity, where seed saving and seed sharing is a common practice and an important aspect of traditional agricultural rituals (Gold 2003). These traditional systems of knowledge are increasingly challenged by technological innovations and have to struggle against the hegemony of modern science. Traditional knowledge and rituals face specialized knowledge about genetic modification and scientists perceiving a public 'subjective' fear challenging their 'objective truths' perspective. Which knowledge is preferred against another, then, is also closely connected to legitimizing story lines.

The ideational dimension of the case of 'Golden Rice' is not just interesting in terms of the current battle of story lines, however. It is also a fascinating case because it shows how subtly ideational power can work over the course of time. The 'Golden Rice' project itself is often described as a strategy of the private sector to enhance its legitimacy and the legitimacy of agricultural biotechnology as such. In a foreword to Potrykus and Beyers seminal *Science* article on 'Golden Rice', Guerinot stated that "[o]ne can only hope that this application of plant genetic engineering to ameliorate human misery without regard to short-term profit will restore this technology to political acceptability" (Guerinot 2000, 243). And even Anderson et al., who take a positive stance on 'Golden Rice' due to its farm productivity gains, suspect that Syngenta's decision to donate its IPRs was a public relations exercise to get more positive media coverage of GM food technology (Anderson et al. November 2004, 4). Similarly, environmental activists describe the transfer of 'Golden Rice' as an effective corporate strategy, using the public sector as a "Trojan horse" (Shiva 2001, 19; ETC Group Oct 12, 2000). The assumption behind that line of argument, as followed by proponents as well as opponents, is that once a GMO is accepted, it will be easier to introduce other varieties, too (Bisserbe Aug 22, 2008).¹⁰

¹⁰ 'Golden Rice' may also have been an easy choice for corporate actors in this respect, as its commercial value is questionable. Syngenta itself states that it "has no commercial interest in the use of Golden Rice in developing countries and does not foresee a commercial market for Golden Rice in developed countries" (Syngenta Homepage 2010).

Even in the interaction with ideational power, material power has failed to shift the political tide with respect to ‘Golden Rice’ to its advantage, to date. This interaction plays out in the question of access to knowledge as well as in the reconstitution of the public discourse on GMOs. Access to knowledge becomes an important issue, when looking at the protection of scientific and especially technological knowledge by patents that can cover living organisms such as plants, seeds, genes and DNA sequences. Patents restrict access to this knowledge to secure benefits from R&D to the inventor or the inventing institution; therefore, the development of GMOs in agriculture is always connected to the negotiation of IPRs. Today, five major groups of large agribiotech companies control access to most of the technology that is needed to do commercial research on GM crops (Nuffield Council on Bioethics 2004, 86).¹¹ They can take considerable influence on the availability of GM crops: “Because of the breadth of protection accorded to the patent holder (the seed or biotech company), concentration in agricultural biotechnology is giving the largest corporations unprecedented power vis-à-vis growers and other stakeholders” (UNCTAD Secretariat 2006, IV). Consequently, three quarters of all new inventions in agricultural biotechnology are controlled by the private sector (Nuffield Council on Bioethics 2004, 86).

‘Golden Rice’ was developed at a public research institute, as pointed out above. Nevertheless, according to an IPR audit of the International Service for the Acquisition of Agribiotech Applications (ISAAA),¹² there were 70 IPRs and Technical Property Rights (TPRs) belonging to 32 different companies and universities that were used in experiments and needed to be licensed (Kryder et al. 2000; Potrykus 2001, 8). And again, ‘Golden Rice’ poses an unusual example in agricultural biotechnology development in so far as a public-private partnership (PPP) between individuals from universities, public research institutions, and the willingness of major multinational corporations to donate licenses offered a solution to the IPR problems. Potrykus and Beyer, the original inventors of ‘Golden Rice’, entered a partnership with Syngenta (formerly AstraZeneca), which granted Syngenta exclusive rights to commercialize the inventions. Syngenta, however, donated all research data, patents and legal rights to the humanitarian project, organized in the Golden Rice Humanitarian Board. According to the partnership, Syngenta retains all the rights for the commercialization of Golden Rice (in the developed world), but seeds are made freely available to farmers and

¹¹ Syngenta, Bayer CropScience, Monsanto, DuPont and Dow AgroSciences.

¹² The ISAAA terms itself a „not-for-profit international organization that shares the benefits of crop biotechnology to various stakeholders, particularly resource-poor farmers in developing countries, through knowledge sharing initiatives and the transfer and delivery of proprietary biotechnology applications” International Service for the Acquisition of Agribiotech Applications (ISAAA).

traders that earn below US\$ 10,000 a year (Nuffield Council on Bioethics 2004, 37) - a strategy that some scholars have termed market segregation (Paul and Steinbrecher Oct 2003). Nevertheless, these licenses allow a 'Freedom-to-Operate' in developing countries (Al-Babili and Beyer 2005, 569). Practically, the Golden Rice Humanitarian Board gives free royalties to public research institutions to support the development of locally adapted varieties in developing countries such as China, India or Bangladesh (Allen 2005).

Even if there seems to be no direct commercial interests at play here (at least on the surface), the concept of patenting and restrictions in access to knowledge already represents an important link between material and ideational dimensions of power. Shiva for instance highlights the marginalization of indigenous knowledge structures: "In central India [...] at the beginning of the agricultural season, farmers gather before the village deity, offer the rice varieties, and then share the seeds. This annual festival of Akti rejuvenates the duty of saving and sharing seed among farming communities" (Shiva 2001, 14). The tradition of sharing seeds stands in direct conflict with IPR protected rice varieties. Although 'Golden Rice' is supposed to become freely available and knowledge of the technology can be exchanged, the question remains if it can be that easily introduced into a context, where local seed cultivation and access to this knowledge has a long tradition. Clearly, with respect to the development of GMOs, financial resources and knowledge production are closely connected, as are market power and knowledge with respect to the use of GMOs. This interaction between material and ideational power, however, does not only provide a potential source of power but also can serve to raise the legitimacy challenges faced by GMO technology.

The second important interaction between material and ideational sources of power can be witnessed in the discursive battle for the hearts and minds of the Indian public and especially farmers. Specifically, economically strong actors have been able to invest into PR strategies to enhance their legitimacy. Thus, the promoters of 'Golden Rice' have pursued far-reaching media campaigns that enabled them to disseminate a legitimizing discourse of humanitarian necessity and urgency, and to advocate it as a rational scientific solution to a global problem. While NGOs and Indian activist networks tend not have the same financial means as corporations or governments, their perceived legitimacy has helped them gain a strong voice in the public and political debate. Actors such as Greenpeace, Action Group on Erosion, Technology and Concentration (ETC Group) and GM critically scientists have been able to challenge the proposed benefits of 'Golden Rice' and introduce a strong critical account of it.

In sum, the long battle over the adoption of ‘Golden Rice’ in India can best be understood on the basis of the ideational contests associated with it. To date, the promotion of rationality and philanthropy discourses has not been able to overcome traditional societal values and knowledge structures. As this case shows then, material power may well be impotent in the context of issues associated with high levels of conflict over legitimacy claims.

Conclusion

These notes on the political processes connected to the introduction of ‘Golden Rice’ in India serve as an illustration of the proposed framework of material and ideational power to assess global and local forces in India’s agricultural biotechnology sector. They reveal a strong role of ideational dimensions of power in this case of agrifood governance. Specifically, the analysis has shown that the protracted introduction of ‘Golden Rice’ into India is connected to a battle between different norms and story lines. Although proponents of ‘Golden Rice’ have a preeminent position when it comes to material power, they have not been able to convert it fully into political power due to their relative legitimacy deficit. Even the donation of the patents by the GMO corporations has not served to change the overall legitimacy challenges faced by agricultural biotechnology and its prominent actors. Further developments in this case will be interesting to watch. After all, ‘Golden Rice’ might come to play an important part in legitimizing the diffusion of GMO technology. The connection of the rationality with the philanthropy story lines has potentially enormous discursive power.

Pointing to the strong role of ideational forces, our framework enables us to analyze the formation and the relation of power in a differentiated manner. (Again, this is a special case, and we do not mean to suggest that material power generally is less important than ideational power in global agrifood governance. Rather, we show that ideational power plays a crucial role under conditions of contested legitimacy claims.) Scientifically, such a differentiated concept of power provides better insights into the overall picture of power relations and the generation of political outcomes. Moreover, a better understanding of how material and ideational, global and local forces interact and how power is exercised opens possibilities for politics to establish fitting checks and balances in a policy field, which is difficult to govern. In sum, a deeper knowledge on power relations in the global agrifood system allows a more systematic assessment of policy options and an opportunity for politics to find suitable governance solutions to regulate power(s) in that sector.

References

- Al-Babili, Salim, and Peter Beyer. 2005. "Golden Rice – Five Years on the Road – Five Years to Go?" *Trends in Plant Science* 10 (12): 565–73.
- Allen, Melanie. "Can Public and Private Sectors Work Together for the Poor?" <http://www.ifpri.org/blog/can-public-and-private-sectors-work-together-poor> (January 26, 2010).
- Anderson, Kym, Lee Ann Jackson, and Chantal Pohl Nielsen. November 2004. *Genetically Modified Rice Adoption: Implications for Welfare and Poverty Alleviation. Discussion Paper No. 0413*. University of Adelaide. Adelaide. 4.
- Arts, Bas. 2003. *Non-State Actors in Global Governance. Three Faces of Power*. Bonn. Max-Planck-Projektgruppe, Recht der Gemeinschaftsgüter. 003/4.
- Assadi, Muzaffar. 2008. *Farmer's Suicide in India: Agrarian Crisis, Path of Development and Politics in Karnataka*. [http://viacampesina.net/downloads/PDF/Farmers_suicide_in_india\(3\).pdf](http://viacampesina.net/downloads/PDF/Farmers_suicide_in_india(3).pdf) (January 28, 2010).
- Bail, Christoph, Robert Falkner, and Helen Marquard, eds. 2002. *The Cartagena Protocol on Biosafety. Reconciling Trade in Biotechnology with Environment and Development?* London: Earthscan Publications.
- Barnett, Michael N., and Raymond Duvall. 2006. "Power in Global Governance" In *Power in Global Governance*, eds. Michael N. Barnett, and Raymond Duvall. Cambridge: Cambridge University Press, 1–32.
- Bertebos Foundation. 2008. *Golden Rice and other Biofortified Food Crops for Developing Countries. Challenges and Potential*. Slöige, Sweden
- Bisserbe, Noemie. Aug 22, 2008. "Golden Scare. A New Genetically Modified Rice Strain Is Breeding Controversy." *Businessworld Online*, Aug 22, 2008. <http://www.businessworld.in/index.php/Economy-and-Banking/Golden-Scare.html> (Accessed January 28, 2010).
- Bocking, Stephen. 2004. *Nature's Experts. Science, Politics and the Environment*. New Brunswick, NJ: Rutgers Univ. Press.
- Clapp, Jennifer, and Doris A. Fuchs, eds. 2009. *Corporate Power in Global Agrifood Governance*. Cambridge, Mass.: MIT Press.
- Cutler, Claire, Virginia Haufler, and Tony Porter, eds. 1999. *Private Authority and International Affairs*. Albany: New York Press.
- Deutscher Bundestag, ed. 2002. *Schlussbericht der Enquete-Kommission Globalisierung der Weltwirtschaft*. Opladen: Leske/ Budrich.
- Enserink, Martin. Apr 25, 2008. "Tough Lessons from Golden Rice." *Science*, Apr 25, 2008. <http://www.sciencemag.org/cgi/content/full/320/5875/468> (Accessed January 28, 2010).
- Oct 12, 2000. *Update on Trojan Trade Reps, Golden Rice, and the Search for Higher Ground. Golden Goosed?*
- Food and Agriculture Organization. 2009. *The State of Food Insecurity in the World. Economic Crises - Impacts and Lessons Learned*. Rom.
- Friedmann, Harriet. 1992. "Distance and Durability: Shaky Foundations of the World Food Economy." *Third World Quarterly* 13 (2): 371–83.
- . 2004. "Feeding the Empire: The Pathologies of Globalized Agriculture" In *The Empire Reloaded*, eds. Leo Panitch, and Colin Leys. London: Merlin Press [u.a.], 124–43.
- Fuchs, Doris. 2005. *Governance by Discourse*. Honolulu, Hawaii. Annual Meeting of the International Studies Association, 1.-5.05.2005. http://www.allacademic.com/meta/p_mla_apa_research_citation/0/7/0/7/4/pages70741/p70741-1.php (January 16, 2009).
- Fuchs, Doris A. 2007. *Business Power in Global Governance*. Boulder, Colorado: Lynne Rienner.

- Glaab, Katharina, and Stephan Engelkamp. 2010. *Of Rituals and 'Golden Rice': The Diffusion of Norms in India and Southeast Asia Between Myths and Discursive Practices*. New Orleans. International Studies Association Conference. 17-20 February 2010.
- Gold, Ann Grodzins. 2003. "Vanishing: Seeds' Cyclicalilty." *Journal of Material Culture* 8 (3): 255–72.
- Golden Rice Humanitarian Board. "Golden Rice Is Part of the Solution". <http://www.goldenrice.org/index.html> (January 28, 2010).
- Greenpeace. 2005. *All That Glitters Is Not Gold: The False Hope of Golden Rice*. Genetic Engineering Briefing Pack. <http://www.greenpeace.org/international/press/reports/all-that-glitters-is-not-gold> (January 28, 2010).
- Guerinot, Mary Lou. 2000. "The Green Revolution Strikes Gold." *Science* 287 (5451): 241–3.
- Hajer, Maarten A. 1995. *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*. Oxford: Oxford University Press.
- Himmelstein, Jerome L. 1997. *Looking Good and Doing Good. Corporate Philanthropy and Corporate Power*. Bloomington: Indiana Univ. Press.
- Holzscheiter, Anna. 2005. "Discourse as Capability. Non-State Actors' Capital in Global Governance." *Millenium: Journal of International Studies* 33 (3): 723–46.
- International Service for the Acquisition of Agribiotech Applications (ISAAA). "Homepage". <http://www.isaaa.org/> (February 03, 2010).
- James, Clive. 2008. *Global Status of Commercialized Biotech/GM Crops: 2008. The First Thirteen Year, 1996 to 2008*. International Service for the Acquisition of Agri-biotech Applications. Ithaca, NY. ISAAA Briefs. 39.
- Jasanoff, Sheila. 2004. *States of Knowledge: The Co-production of Science and Social Order*: Routledge.
- Jessop, Bob. 2008. *State Power. A Strategic-relational Approach*. Cambridge: Polity Press.
- Kneen, Brewster. 1995. *From Land to Mouth. Understanding the Food System*. Toronto: NC Press Limited.
- Koller, Peter. 1991. "Facetten der Macht." *Analyse und Kritik* (13): 107–33.
- Kryder, R. David, Stanley P. Kowalski, and Anatole F. Krattiger. 2000. "The Intellectual and Technical Property Components of Pro-vitamin A Rice (GoldenRice): A Preliminary Freedom-to-operate Review'." *ISAAA Briefs* 20: 74.
- Lang, Tim. 2003. "Food Industrialisation and Food Power: Implications for Food Governance." *Development Policy Review* 21 (5-6): 555–68.
- Lang, Tim, and Michael Heasman. 2004. *Food Wars: The Global Battle for Mouths, Minds and Markets*: Earthscan/James & James.
- Living on Earth. "Golden Rice. Transcript". <http://www.loe.org/shows/segments.htm?programID=09-P13-00005&segmentID=3> (January 28, 2010).
- Lukes, Steven. 2005. *Power. A Radical View*. Basingstoke: Palgrave Macmillan.
- MacMillan, Tom. 2005. *Power in the Food System: Understanding Trends and Improving Accountability*. Food Ethics Council. Brighthon. Background Paper.
- Millstone, Erik, and Tim Lang. 2008. *The Atlas of Food. Who Eats What, Where, and Why*. London: Earthscan.
- Mohan, Rakesh. 2006. "Agricultural Credit in India: Status, Issues and Future Agenda." *Economic and Political Weekly* 41 (11): 993–1007.
- Nandy, Ashis. 1990. *Science, Hegemony and Violence: A Requiem for Modernity*: The United Nations University Delhi: Oxford University Press, Tokyo.
- Nelkin, Dorothy. 1975. "The Political Impact of Technical Expertise." *Social Studies of Science* 5 (1): 35–54.
- Newell, Peter. 2007. "Biotech Firms, Biotech Politics: Negotiating GMOs in India." *The Journal of Environment Development* 16 (2): 183–206.

- Noelle-Neumann, Elisabeth. 1996. *Öffentliche Meinung. Die Entdeckung der Schweigespirale*. Frankfurt am Main, Berlin: Ullstein.
- Nuffield Council on Bioethics. 2004. *The Use of Genetically Modified Crops in Developing Countries. A Follow-up Discussion Paper*. London.
- Nye, Joseph S. 1991. *Bound to Lead. The Changing Nature of American Power*. New York: Basic Books.
- Osgood, Diane. 2001. "Dig It Up: Global Civil Society's Responses to Plant Biotechnology" In *Global Civil Society 2001*, eds. Helmut Anheier, Marlies Glasius, and Mary Kaldor. New York: Oxford University Press, 79–107.
- Paul, Helena, and Ricarda Steinbrecher. Oct 2003. *Golden Rice, Patents and Vitamin A Deficiency. EcoNexus Briefing*. <http://www.econexus.info/pdf/ENx-Golden-Rice-HC-2003.pdf> (January 28, 2010).
- Phillips, Peter W. B., and Robert Wolfe. 2001. "Governing Food in the 21st Century. The Globalization of Risk Analysis" In *Governing Food: Science, Safety and Trade*, eds. Peter W. B. Phillips, Robert Wolfe, and Canada-UK colloquium. Montreal: McGill-Queen's University Press, 1–10.
- Potrykus, Ingo. 2001. "The Golden Rice Tale." *In Vitro Cellular & Developmental Biology* 37 (2): 93–100.
- Rabinow, Paul, ed. 1984. *The Foucault Reader*. New York: Pantheon Books.
- Reljić, Dušan. 2001. "Der Vormarsch der Megamedien und die Kommerzialisierung der Weltöffentlichkeit" In *Die Privatisierung der Weltpolitik*, eds. Tanja Brühl, Tobias Deibel, Brigitte Hamm, Hartwig Hummel, and Jens Martens. Bonn: Dietz.
- Scott, Stefanie, Peter Vandergeest, and Mary Young. 2009. "Certification Standards and the Governance of Green Foods in Southeast Asia" In *Corporate Power in Global Agrifood Governance*, eds. Jennifer Clapp, and Doris A. Fuchs. Cambridge, Mass.: MIT Press, 61–92.
- Seshia, Shaila, and Ian Scoones. 2003. *Tracing Policy Connections. The Politics of Knowledge in the Green Revolution and Biotechnology Eras in India*. Brighton: Institute of Development Studies.
- Shiva, Vandana. 2000. *Stolen Harvest. The Hijacking of the Global Food Supply*. London: Zed Books.
- . 2001. "Golden Rice and Neem: Biopatents and the Appropriation of Women's Environmental Knowledge." *Women's Studies Quarterly* 29 (1/2): 12–23.
- Sustainable Food Laboratory. <http://www.sustainablefoodlab.org/> (October 14, 2009).
- Syngenta Homepage. "What Syngenta thinks about...". http://www2.syngenta.com/en/corporate_responsibility/syngentathinks_full.html#goldenrice (Jan 05, 2010).
- UNCTAD Secretariat. 2006. *Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry*. http://unctad.org/en/docs/ditccom200516_en.pdf (January 23, 2010).
- World Bank. "India: Priorities for Agriculture and Rural Development". <http://go.worldbank.org/8EFXZBL3Y0> (October 12, 2009).
- World Health Organization. "Micronutrient Deficiencies. Vitamin A Deficiency". <http://www.who.int/nutrition/topics/vad/en/index.html> (January 23, 2010).